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NOTES ON TWO SPECTROSCOPIC ORBITS*

(Abstract)

Observations taken in 1920 and in 1921 of Boss 3511, whose orbit was previously determined, are satisfied with a period slightly different to the earlier determination and complete agreement seems unobtainable. Similarly for the one-day binary Boss 4622 the observations of different years seem to demand slightly different periods.

W. E. HARPER.

THE SPECTRA OF THE COMPONENTS OF VISUAL DOUBLE STARS*

(Abstract)

A statistical study, recently made by the writer, of the spectra of the components of physically-connected visual double stars, the majority moderately close in angular separation, has been based upon the individual spectra of (*a*) pairs photographed by him with the light $\frac{1}{2}$ -prism spectrograph attached to the 36-inch refractor of the Lick Observatory; (*b*) stars observed by Dr. Adams and his colleagues at Mount Wilson; and (*c*) doubles classified by Miss Cannon at the Harvard Observatory. A summary of the main conclusions derived from this investigation is herewith presented.

(1) The spectrum of the secondary component of a dwarf star is generally *redder* than that of the primary, whereas the spectrum of the fainter component of a giant star is usually *bluer* than that of the brighter one. In both cases, the absolute difference in spectral class seems ordinarily to be related to the disparity in magnitude between the components, being practically zero when they are equal in luminosity, or nearly so (with a few exceptions, notably among the giant stars), and increasing on the whole as the difference in magnitude increases.

(2) With some exceptions, the spectra of the components of double stars are so related to each other that they conform to the Hertzsprung-Russell configuration of the stars plotted according to spectral class and absolute magnitude. In this arrangement the fainter component normally precedes the brighter one, regardless of whether the latter be a giant or a dwarf, in the order prescribed by Professor Russell in his theory of stellar evolution. The initial statement in conclusion (1) follows at once as the necessary consequence of this tendency.

(3) The difference in spectral class between the components of double stars appears to be independent of their projected linear separation in astronomical units.

(4) From the meagre data available for the mass-ratio in a few binary systems (all dwarf stars), the difference in spectral class between the components shows a tendency to decrease as the ratio of the masses approaches unity.

FREDERICK C. LEONARD.

Lick Observatory, Mount Hamilton, Calif., July 2, 1921.

THE PHOTO-ELECTRIC PHOTOMETER OF THE LICK OBSERVATORY,
AND SOME PRELIMINARY RESULTS OBTAINED WITH IT*

(Abstract)

The photometer was built partly in the Observatory shop at Mount Hamilton and partly in the shop of the Physics Department at Berkeley. The lantern slides exhibit the instrument in detail. It differs from other photometers of this class in numerous details. The most conspicuous difference is in the manner of cutting down the light incident on the cell. When two objects are to be compared one must be reduced until both are of about the same brightness. Other observers have done this by means of objective diaphragms or shade glasses at the focus. In the present instrument it is done by a sectored disk driven by a small motor.

Tests of the photometer were begun in the Physical Laboratory of the University of California and continued at the Lick Observatory. Much experimental work was necessary to put the instrument in good running order. The observing so far has included measures of the *Pleiades* to check the laboratory calibration; of stars of various spectral types to obtain the color-equation of the instrument; and of several variable stars.

EDITH E. CUMMINGS.

THE PHYSICAL MEMBERS OF THE PLEIADES GROUP*

(Abstract)

Two hundred and forty-four stars of the region of the *Pleiades* were found to have proper-motions differing less than $2''.0$ per century from the mean motion of the group, and they have to be considered as physical members of the group. Their spectral types and colors show a definite relation to their photographic magnitudes. Between the limits $2^m.8$ to 11^m the range in spectral classes